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EXAMINER				
SAYADIAN, HIRAYR				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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## **DETAILED ADVISORY OFFICE ACTION**

### **The 4/1/2011 After Final Amendment Is Not Entered**

1. An affidavit or other evidence submitted after a final rejection or other final action in an application, but before or on the same date of filing an appeal, may be admitted upon a showing of good and sufficient reason why the affidavit or other evidence is necessary and was not earlier presented. See, for example, 37 CFR § 1.136.

The 4/1/2011 Reply presents factual info couched in arguments by the Applicant (Dr. Udagawa), but fails to present an affidavit to attest to the accuracy of the info.

Accordingly, the 4/1/2011 Reply is denied entry because the affidavit-like Reply raises new issues not considered before, resolving which require further consideration or search, or both, at least to determine the correctness of the provided info.

Rather than reducing or simplifying the issues for appeal, the Reply also materially increases and complicates the issues for appeal.

The Reply therefore places the application in worse form for appeal.

For the above reasons, the 4/1/2011 Reply is therefore not entered.

The admissions in the 4/1/2011 Reply however is made of record.

### **Status of Claims Pending as of the 11/26/2010 Office Action**

2. The rejections in the 11/26/2010 "Office Action" are maintained.

### **Response to Arguments**

3. The arguments in the 4/1/2011 "Reply" to the 11/26/2010 "Office Action" have been fully considered. These arguments however are not found persuasive.

The 4/1/2011 Reply presents three arguments for why the claims are patentable over the applied prior art. Again, the After Final Reply is not entered because it presents factual issues (akin to an affidavit) but without any of the required declarations by the presenter.

The Reply argues: (1) the diffusion of phosphorus atoms into the active layer 104 does not result in the claimed profile; (2) the phosphorus atom concentration in the AL is not subject to routine optimization; and (3) a POOSITA would optimize the composition of layers in contact with the AL to avoid lattice mismatch, but would not modify nor optimize the composition of the AL.

In response, Examiner notes that contention 1 contradicts basic physics and the Reply's explicit recognition.

Specifically, and as an initial matter, the claim language is "wherein the light-emitting layer has a profile of phosphorus atom concentration that gradually decreases from a bottom thereof in a thickness direction." This scope includes the P atom concentration decreasing and then increasing, and does not require a specific positioning of the bottom. And as the Reply explicitly argues (see, for example, the third full paragraph on page 3 of the Reply), the profile of concentration of phosphorus in the AL 104 is highest at the 103/104 interface (bottom of AL 104) and lowest at the middle portion of the AL 104.

With respect to contentions 2 and 3, the Reply notes that the Final Rejection has not provided any evidence that a concentration gradient in the AL 104 can smooth the transition at the lower and upper hetero-junctions to alleviate lattice mismatch (see the second sentence of the first paragraph on page 4 of the Reply). The Reply then strongly asserts (by reference to the applicant, inventor Dr. Udagawa, without providing an affidavit and therefore short of declaration subject to requirements of an affidavit) that POOSITA would not vary the phosphorus content of an AL to lattice match the upper and lower hetero-junctions of the AL with neighboring layers, but would instead modify the content of the neighboring layers to achieve this. See, for example, the last paragraph on page 4 of the Reply through paragraph three of page 5.

In response, it is noted that contentions 2 and 3 include: (1) an assertion (short of an affidavit; that POOSITA would not modify the AL to achieve lattice matching) and (2) an admission (that POOSITA would modify the layers neighboring the AL to achieve lattice matching).

In response, Examiner treats the statement that the Final Rejection does not present any evidence that POOSITA would modify the AL to achieve lattice matching as a request for presenting what is well known. And notes that Udagawa (PGPUB US 2001/0054717) explicitly teaches modifying a gallium nitride AL so that the phosphorus content of the AL is arranged to lattice match with boron phosphide neighboring layer "thereby contributing to the high-luminous intensity emission of the light-emitting device." See, for example, [0021]-[0022] of Udagawa '717. This teaching is explicit recognition by the prior art that phosphorus in the AL 103 is a result affecting critical parameter, varying which by routine experimentation optimizes the result of lattice matching to "thereby contributing to the high-luminous intensity emission of the light-emitting device."

Udagawa '717 therefore is both evidence of the well known nature of the desirability of modifying the content of the phosphorus of gallium nitride AL to lattice match with boron phosphide neighboring layers(s) and evidence of the result affecting critical parameter nature of the phosphide concentration.

According to well established patent law precedents therefore it would have been obvious for POOSITA at the time of the invention of this application to have optimized (for example, by routine experimentation) the phosphorus concentration of AL 103 to lattice match with layers 103 and 105, as taught by Udagawa '717.

In view of the explicit teachings of the prior art Udagawa '717 teachings, therefore, the assertions in contentions 2 and 3 are considered and found unpersuasive because they are contrary to the explicit teachings of Udagawa '717 and what POOSITA and the art, in fact, well knows.

Independent of controlling the phosphorus content of AL to "thereby contribute to the high-luminous intensity emission of the light-emitting device," POOSITA also well knows that modifying the phosphorus content of AL neighboring layers is another method for lattice matching the neighboring layers with the AL (see, for example, Udagawa PGPUB US 2002/0000563, [0046]), as the Reply explicitly argues and, therefore, admits (see, for example, the last paragraph on page 4 of the Reply through paragraph three of page 5).

In view of the admission of contentions 2 and 3 and the admission of contention 1 (that phosphorus diffuses into AL 104 from layers 103 and 105) it is established that POOSITA also knows that modifying the content of layers 103 and 105, neighboring AL 104, would result in the claim-recited profile for the phosphorus concentration in AL 104. And additionally POOSITA would modify the phosphorus concentration of layers 103 and 105 by routine experimentation to optimize the diffused phosphorus in AL 103 so lattice matching is better achieved "thereby contributing to the high-luminous intensity emission of the light-emitting device."

Accordingly, rejecting the pending claims as being unpatentable over the prior art is proper. And the rejection of the pending claims over the prior art therefore is maintained.

## CONCLUSION

4. **The shortened statutory period for reply to this Office Action expires FIVE MONTHS from 11/26/2011, which is the mailing date of the Final Office Action.**

Extension of time for the period for reply may be obtained under 37 CFR § 1.136(a). **The maximum period for reply, however, is SIX MONTHS from 11/26/2011, which is the mailing date of the Final Office Action.**

Any inquiry concerning this communication or earlier communications from an Examiner should be directed to Examiner Hrayr A. Sayadian, at (571) 272-7779, on Monday through Friday, 7:30 am – 4:00 pm ET.

Art Unit: 2814

If attempts to reach Mr. Sayadian by telephone are unsuccessful, his supervisor, Supervisory Primary Examiner Wael Fahmy, can be reached at (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available only through Private PAIR. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. The Electronic Business Center (EBC) at (866) 217-9197 (toll-free) may answer questions on how to access the Private PAIR system.

/Hrayr A. Sayadian/

Primary Examiner, Art Unit 2814